The Avifauna of introduced Eucalyptus plantations in Maharashtra[1]

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A study of the avifauna of two small introduced Eucalyptus plantations indicated extensive changes in species composition at the end of the monsoon season, and changes in resident species with advancing stages of plantation development. The birds seemed to be attracted to the outer areas of the plantation which offer more diverse vegetation. These plantations provide an opportunity to study the effects of introduced vegetation on local fauna.

INTRODUCTION

Small Eucalyptus plantations, started by the Indian Government to control soil erosion, provided rare opportunities to study the wildlife of isolated, introduced, islands of vegetation. Awsari and Pachgaon are two such plantations, situated on the leeward side of the Western Ghats approximately 170 kilometres east of Bombay. Eucalyptus has been introduced extensively throughout the sub-continent to start new plantations. In this area, plantations appeared to be widely scattered, separated by approximately 80 or 90 kilometres. These small plantations could have an important effect on the fauna of the area. Not only are they concentrated islands of an introduced tree, but they are fenced, cultivated, and protected. This maintenance is important because, during the monsoon, plants grow and fruit and food seems abundant, but after the rains the land outside the plantation fences is soon dry and quickly over-grazed.

The two plantations presented contrasting vegetation. The plantation at Awsari, started in 1966, covers 87 hectares and is planted with Eucalyptus (*E. tereticornis*), Sissu (*Dalbergia sissu*), Siras (*Albizzia lebbek*), Neem (*Melia azadirachta*), and Tarwad (*Cassia auriculata*).

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The plantation consists of two distinct areas: one, called the "inner area" in this paper, is almost 100 per cent Eucalyptus trees, 10-14 metres high, with little understory; the other, called "the outer area", has approximately 50 per cent of the ground covered with trees of several species, 3-7 metres high, with the remainder of the ground covered by grass and underbrush fading into the surrounding barren grasslands. The Pachgaon plantation, 57 kilometres to the south, covers 238 hectares and is planted with Eucalyptus, Babul (*Acacia arabica*), Silver Oak (*Grevillea* sp.), and a species of bamboo. The trees are small (7-10 metres high) and very widely scattered. The extensive understory is composed of grass and shrubs up to one metre high.

The two plantations show stages of vegetation structure similar to ecological succession. These stages do not represent a natural succession because the tree species are introduced and maintained by man but they can be thought of as stages in a plantation development: from barren grassland, through protective fencing with high grass and scattered small trees, to thick plantations with outer areas of diverse vegetation.

The aim of this study was to categorize the avifauna of each plantation by species, abundance, position, and nesting activity. The study began in July during the height of the monsoon and continued for a total of five months into the December dry season.

Methods and Materials

Awsari or Pachgaon plantation was observed during 34 days between 11 July 1970 and 4 December 1970. Birds were identified by plumage with 7 × 35 binoculars on systematically walked routes through the plantations. After September, two mist nets (12.8 × 2.1 m, 38 mm mesh) were available which were put up for a total of 400 net-hours in various locations within the study areas. Other observations at Awsari included perching and nest locations of selected common species of birds.

Results and Discussion

Extensive changes in species composition were observed at the monsoon season. Table 1 shows that 20 of the 48 identified species were observed in either area for the entire length of the study. Nine species were observed for the first time at the end of the monsoon and stayed in the area until the end of the study. Three species left the area after the monsoon and 16 species were observed for only a short time.

As only five of these species (*Coturnix coturnix, Sylvia hortensis, S. curruca, Carpodacus erythrinus,* and *Emberiza bruniceps*) are described as being migratory (Ali 1968), the extensive seasonal changes in species could indicate the principal effect of these plantations on local avifauna. After the monsoon, as the grazed grasslands surrounding the plantations become dry, the vegetative structure within the plantations remains stable. Even though there is no additional fruiting associated with these changes, opportunistic local birds can invade

TABLE 1

IDENTIFIED SPECIES

	Species	Dates Observed J.A.S.O.N.D.*	Approx. No.
Residents	House Crow (*Corvus splendens*)	– – – – – –	C
	Jungle Babbler (*Turdoides striatus*)	– – – – – –	C
	Baybacked Shrike (*Lanius vittatus*)	– – – – – –	C
	House Sparrow (*Passer domesticus*)	– – – – – –	C
	House Swift (*Apus affinis*)	– – – – – –	C
	White Scavenger Vulture (*Neophron percnopterus*)	– – – – – –	C
	Jungle Crow (*Corvus macrorhynchos*)	– + – + – +	C
	Redvented Bulbul (*Pycnonotus cafer*)	– + – + – +	C
	Drongo (*Dicrurus adsimilis*)	– + – + – +	11
	Indian Wren Warbler (*Prinia subflava*)	– + – + – +	11
	Common Myna (*Acridotheres tristis*)	– + – + – +	C
	Whitethroated Munia (*Lonchura malabarica*)	– + – + – +	C
	Common Green Bee-eater (*Merops orientalis*)	– + – + – +	C
	Pariah Kite (*Milvus migrans*)	– + – + – +	C
	Little Brown Dove (*Streptopelia senegalensis*)	– + – + – +	C
	Indian Robin (*Saxicoloides fulicata*)	+ + + + + +	C
	Rufousbacked Shrike (*Lanius schach*)	+ + + + + +	C
	Roseringed Parakeet (*Psittacula krameri*)	+ + + + + +	C
	Alpine Swift (*Apus melba*)	+ + + + + +	C
	Ring Dove (*Streptopelia decaocto*)	+ + + + + +	C
Emigrants	Crested Lark (*Galerida cristata*)	– +	5
	Redwattled Lapwing (*Vanellus indicus*)	– – –	C
	Common Weaver Bird (*Ploceus philippinus*)	– + – +	C
Immigrants	Purple Sunbird (*Nectarinia asiatica*)	– – – –	5
	Blackwinged Kite (*Elanus caeruleus*)	– – – –	2
	Small Skylark (*Alauda gulgula*)	– – – –	C
	Common Quail (*Coturnix coturnix*)	– + – +	C
	Crow Pheasant (*Centropus sinensis*)	+ + +	4
	Common Babbler (*Turdoides caudatus*)	+ + +	C
	Orphean Warbler (*Sylvia hortensis*)	– +	5
	Common Rosefinch (*Carpodacus erythrinus*)	– +	2
	Rufoustailed Finch-Lark (*Ammomanes phoenicurus*)	– +	3

Common Nightjar (*Caprimulgus asiaticus*)	+					1
Grey Shrike (*Lanius excubitor*)		−	+			2
Small Minivet (*Pericrocotus cinnamomeus*)		−	−	−		2
Lesser Whitethroat (*Sylvia curruca*)			+			1
Rain Quail (*Coturnix coromandelica*)				−		1
Pied Bushchat (*Saxicola caprata*)			−	−		2
Yelloweyed Babbler (*Chrysomma sinense*)				+		C
Purplerumped Sunbird (*Nectarinia zeylonica*)					+	1
Indian Pipit (*Anthus novaeseelandiae*)				−	+	12
Quaker Babbler (*Alcippe poioicephala*)					+	1
Redwinged Bush Lark (*Mirafra erythroptera*)					+	1
Wood Shrike (*Tephrodornis pondicerianus*)				−	+	3
Redheaded Bunting (*Emberiza bruniceps*)				+	+	2
Ashy Wren-Warbler (*Prinia socialis*)					+	3
Whitebacked Munia (*Lonchura striata*)					+	1
Spotted Munia (*Lonchura punctulata*)					+	1

Transients

Species observed at Pachgaon only ———, Awsari only +++, both —+—+, C means common. *J=July, A=August, etc.

the plantations and take advantage of the protection and food sources offered by the more stable vegetation.

During the dry months, the grasslands outside the plantations were observed to contain only a few Larks, Pipits, and Crows. Table 1 shows that 13 species were observed at Pachgaon and not Awsari, 18 at both, and 17 at only Awsari. The definite increase in vegetation seen in the stages of plantation development and these concomitant changes in resident species further suggest the parallel of plantation development to ecological succession.

The results of mist netting showed that the birds at Awsari were concentrated in the outer, more diverse, area. Over three times as many species and almost seven times as many birds per net-hour were captured in the outer area as in the inner area. Perhaps the higher foliage of the Eucalyptus tree caused fewer birds to be captured in the ground-level nets in the inner area, but walking observations supported the conclusion that few birds forage in the inner area. Data taken over nine days shows that as many birds were seen perching on Eucalyptus as other trees. However, tabulation of the nest locations of the Common Weaverbird (*Ploceus philippinus*), Redvented Bulbul (*Pycnonotus cafer*), Rufousbacked Shrike (*Lanius schach*), and Little Brown Dove (*Streptopelia senegalensis*) at Awsari showed that no nests were found in Eucalyptus trees or in the inner area but 74 nests were found in the outer area on Babul, Cassia, Sissu, and one Toddy Palm (*Borassus flabellifer*).

Orians (1969) has stated that the number of bird species in undis-

turbed forests in Costa Rica is not measurably affected by the number of species of trees in the forest. The difference in the bird species diversity between the inner and outer areas at Awsari seems to contradict this finding. Even though there is a wider vertical distribution of foliage in the primarily single species inner area, more birds and more species were observed in the outer area containing multiple species of trees. This difference could be associated with a "quality" of the Eucalyptus tree to support bird life rather than the height of foliage distribution or tree species diversity.

Thus, besides their economic importance and despite the controversial usefulness of Eucalyptus to wildlife, these introduced plantations have enhanced the local avifauna by providing stable vegetation. It is probable that the usefulness of these plantations to wildlife would be much increased if more diverse tree species were planted.

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